In the Specifications

Please replace the originally filed paragraphs with the following paragraphs, in accordance with the appropriate paragraph number:

[0049] The preferred embodiment utilizes a known method for viscosity measurement, comprising an acoustic wave device 45 comprising a piezoelectric crystal 25, with an input transducer 30 and an output transducer 40 ~~transducers~~ coupled to it. The input transducer is coupled to a power source 50, which injects a harmonic signal of known power level and frequency. The energy coupled to the input transducer causes an acoustic wave 35 to travel in the crystal, and impart a wave to the fluid 10. Since energy is transferred to the fluid 10, the level of power that arrives at the output transducer 40 is lower than the input power. The difference therebetween is referred to as insertion loss. The insertion loss is representative of the acoustic impedance imparted by the fluid, and is representative of the fluid viscosity. The output level is measured by an output power detector 55, and the measurement results are transferred to an insertion loss summation module 60 that may be implemented by hardware or software. The insertion loss summation is transferred to a viscosity translation module 65, typically a numerical computer, a display device, a process controller, and the like.

[0051] If a fluid is in contact with the crystal face, the crystal face displacement imparts a shear wave to the fluid which it contacts. The shear wave travels a distance into the fluid but normally decays rapidly, at a rate related to the viscosity, density, temperature and other characteristics of the fluid. The distance traveled by the wave before it decays below practical use level is referred to in these specifications as penetration depth δ. Together with other parameters of the fluid, the shear rate caused by the wave may be calculated by first calculating the penetration depth

$$\delta = \sqrt{2\eta / \omega\rho}$$

where,

ω is the radian frequency of the applied harmonic wave having frequency, F, and $\omega=2\pi F$,

ρ is the density of the sample liquid

and

η is the intrinsic viscosity (Pascal-seconds).

[0053] As will be clear to those skilled in the art, certain parameters such as temperature (an important measurement condition) and density (needed to obtain shear rate and viscosity from power level measurements) may be assumed or measured. The preferred embodiment utilized separate measurements of the temperature and the density. The method of measurement is immaterial for the present invention. It is also clear that the crystal face does not need to actually contact the fluid, but that any stiff material may be used as an intermediary layer 20, provided the layer is compatible with and integrated into the design of the acoustic ~~wave device.~~

[0061] An alternate embodiment of the proposed invention is depicted in ~~figure~~ Fig. 5. The figure depicts a one-port acoustic wave device 500, such as the well-known quartz-crystal microbalance by way of example, comprising at least a piezoelectric material with positive 510 and negative 515 polarity electrode arrays. The arrays consist of at least one conductive electrode of each polarity having any of the multitude of physical structures known to form a transducer. At least one of the electrodes is coupled to a driving electrical circuit 520 and power level detector 525. The power level detector 525 measures a single power level, which determines P_{avg}. The remainder of the previously-described methods function as described based on the measured P_{avg}. In the preferred embodiment, viscosity measurement is done by measuring deviation from P_{avg}. The system may also include other detection modules 530 (such as for phase, frequency, impedance and the like) for measuring viscosity by other known methods. The driving electrical circuit 520 may be any of a fixed frequency source, an oscillator designed to oscillate at the resonant frequency of the acoustic wave device, a variable frequency source

designed to track a property of the acoustic wave device, or other excitation circuitry as may be devised to drive the acoustic wave device's transducer at a known amplitude and frequency.

[0062] Yet another embodiment of the proposed invention is depicted in ~~figure~~ Fig. 6, which shows a one-port acoustic wave device 600 with positive 610 and negative 615 electrode arrays coupled to a directional coupler 605. Driving circuitry 620 capable of providing harmonic signal power, and an incident wave power detector 625 are coupled to the incident port 660 of the directional coupler 605. The transducer formed by the positive 610 and negative 615 electrode arrays, is coupled to the transmission port 665 of the directional coupler 605 and a reflected signal power detector ~~630~~ 650 is connected to the reflection port 670 of the directional coupler 605. Comparison of the incident and reflected power levels yields a reflection coefficient and thus an input impedance of the acoustic wave device while ~~the incident power level defines P_{avg}. As in the case of the embodiment depicted in~~ Fig. 5 the detection methods of the shear rate at which the viscosity measurement is carried out is derived from P_{avg}.